City(i, x, y, 0 :- i = 9,

47

City(i, x, y, 0 :- i = 12,

x >= 2,

y >= 10,

x -y -0.05t <= -8,

y -0.05t <= 10,

* >= 0,
* <= 40.

City(i, x, y, t) :- i = 10, x -y ›.= -6,

x - 0.025t <= 5,

y >= 11, t ›.= 0,

* <= 40.

City(i, x, y, t) :- i = 11,

x +0.025t >= 8,

y >= 8,

3x + y <= 32,

* >= 0,
* <= 40.

x >= 6,

o

City(i, x, y, t) i = 15,

y >= 6,

x 0.05t <= 6,

y 0.05t <= 6,

* ›.= 0,

t <= 40.

City(i, x, y, = 13,

x 8,

y + 0.02t >= 7.8,

x <= 9,
  
y<=8'

* ).= 0,
* <= 40.

City(i, x, y, t) = 14,

x >= 9,

y + 0.075t >= 8,

x <= 13,

y <= 8,

* >= 0, t <= 40.

Y <= 8,

49

x + y <= 22,

x + y >= 21,

y + 0.02t >= 7.8, t >= 0,

t <= 40.

end %City%

**Appendix B**

50

**The Constraint Model of Face**

**Example**

|  |  |  |
| --- | --- | --- |
| begin%Face%  Face\_Laugh\_1(i, x, x > 100,  x - y > -450,  y < 650,  x + y < 1250,  x < 700,  2x - y 2t < 1150,  y 0,  2x + y + 2t > 450,   * ›.= 0, * <= 20. | Y, | t) = 0, |
|  |  |
|  |  |

`09 < x

Tc3

`T09 = T 'x iT)J-e2

* N => `0 =< 4

`09n < A +

`009 < x

`009T > A + x9'T

`E09 = T -: (4 'A `x 'T)eiTH

* OZ => 4 `0 =< 4

`09t- > A x
  
`00Z > x

`00- < A - x9'T

`ZO9 = T (4 'x `T)9. TH

* 0Z => 4 `0 4
    
  `099 < A `009 > x `00L

`00Z < x

`T09 = T 'A 'x 'T)eITH

y < 500,

52

x < 100,

3x + y > 600,

t >= 0,

* <= 20.

Ear(i, x, y, t) = 602,

y < 500, x < 750, 3x y < 1800,

x > 700,

* >= 0, t <= 20.

Mouth\_Laugh\_1(i, x, y, t) a. = 1,

y > 90,

x y 2t < 400,

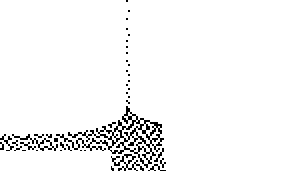
0.5x - y 0.5t > 120,

* >= 0,
* <= 20.

Mouth\_Laugh\_1(i, x, y, = 2,

0.5x - y 0.5t < 120,

y 0.6t < 140,

04

lffiNEEMEMEMZSOMMaMENVUMMWOMMMMWMW

53

0.5x + y + 0.5t > 280,

y > 90,

* >= 0,
* <= 20.

Mouth\_Laugh\_1(i, x, y, = 3,

y > 90,

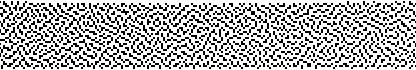
x + y + 2t> 400,

0.5x + y + 0.5t < 280,

* ›.= 0,
* <= 20.

|  |  |  |  |
| --- | --- | --- | --- |
| Eye\_Laugh\_1(i,  y + 0.8t < 450,  x + y 0.5t <  x y - 0.5t <  y 0.8t > 350,  x + y + 0.5t >  x y + 0.5t >  t >= 0,  t <= 20.  Eye\_Laugh\_1(i, | x, y,  1050,  250,  850,  50,  x, y, | =  = |  |

y + 0.8t < 450,



x + y 0.5t < 750,

54

x y - 0.5t < -50,

y 0.8t > 350,

x + y + 0.5t > 550, x y + 0.5t > -250, t >= 0,

* <= 20.

Eye\_Bow(i, x, y, t) . 701,

x + 0.5t > 175,

y + 0.5t < 500,

x 0.5t < 325,

y > 475,

* >= 0,
* <= 20.

Eye\_Bow(i, x, y, t) = 702,

x + 0.5t > 475,

y + 0.5t < 500,

x 0.5t < 625,

y > 475,

t >= 0,

t <=. 20.

Nosed, x, y, t) i = 21,

55

y > 200,

2x + y < 1160,

2x - y > 440,

t 7= 0,

t <= 20.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Eye\_Eyea, x,  x > 220,  x - y -190,  y < 430,  x + y < 690,  x < 280,  x - y < -110,  y > 370,  x + y 610,   * >= 0, * <= 20. | 3r, | :- i = 101, |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

Eye\_Eye(i, x, y, t) = 102,

x > 520,

x - y > 110,

y < 430,

x + y < 990,

x < 580,

56

x y < 190,

y > 370,

x + y > 910,

* 0, t <= 20.

Eye\_Surprise\_1(i, x, y,

y - 1.2t < 450,

x + y - 0.5t < 1050,

x y 0.5t < 250,

y + 1.2t > 350,

x + y + 0.5t > 850,

x y + 0.5t > 50,

* >. 0,
* <= 20.

Eye\_Surprise\_1(i, x, y, t) . 12,

y 1.2t < 450,

x + y 0.5t < 750,

x y 0.5t < -50,

y + 1.2t > 350,

x + y + 0.5t > 550, x y + 0.5t > -250,

57

t >= , t <= 20 .

end°hFace%

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| --- | --- |
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